



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/408,972	09/29/1999	MARTIN M. DENEROFF	499.038US1	4705

21186 7590 02/26/2002

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. BOX 2938  
MINNEAPOLIS, MN 55402

EXAMINER

DECKTER, STEPHANIE M

ART UNIT	PAPER NUMBER
----------	--------------

2183

DATE MAILED: 02/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

NM

**Office Action Summary**

Application No.

09/408,972

Applicant(s)

DENEROFF ET AL.

Examiner

Stephanie M. Deckter

Art Unit

2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 September 1999 and 05 July 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 September 1999 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Papers Submitted***

1. It is hereby acknowledged that the following papers have been received and placed of record in the file: Information Disclosure Statement as received on 07/05/01.

### ***Specification***

2. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.
3. The disclosure is objected to because of the following informalities: Please correct the phrase "fourth router 710" on lines 14-15 and 16 of page 11 to read "fourth router 718" to agree with the previous sentence and figure 7. Appropriate correction is required.

### ***Drawings***

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 902, 904, 906, and 907 as shown in figure 9; 1062, 1070, and 1072 as shown in figure 10; 1150, 1152, 1164, 1170, 1172, 1178, and 1180 as shown in figure 11; 1250, 1252, 1262, 1270, 1272, 1274, 1276, 1278, and 1280 as shown in figure 12; 1486, 1488, and 1489 as shown in figure 14; 1587, 1588, 1589, 1592, and 1593 as shown in figure 15; 1686, 1688, 1689, 1690, 1691, 1692, and 1693 as shown in figure 16. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Art Unit: 2183

5. The drawings are objected to because the reference numerals 1150, 1152, 1154, and 1156 of figure 11 are not clear and appear to read as 1050, 1052, 1054, and 1056. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Objections***

6. Claim 6 is objected to because of the following informalities: Please change the word “tack” in the 6<sup>th</sup> line of the claim to “tact.” Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 4, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Galles et al, U.S. Patent Number 5,669,008 (herein referred to as Galles). Referring to claim 1, Galles has taught a massively parallel processing system comprising:

- a. a plurality of processing element nodes (column 5, lines 19-24);
- b. a scalable interconnection network (column 5, lines 29-40) comprising:
  - i. a plurality of physical communication links (column 5, lines 42-44); and
  - ii. a plurality of first level routers for interconnecting the plurality of processing element nodes in a cluster (column 6, lines 32-35 and column 2, lines 22-33); and

Art Unit: 2183

- iii. one or more metarouters for interconnecting the plurality of first level routers so that each one of the routers in a first cluster is connected to all other clusters through one or more metarouters (column 6, lines 45-46 and 52-58).

9. Referring to claim 2, Galles has taught the massively parallel processing system wherein each one of the clusters is a two-dimensional hypercube (column 6, lines 32-34 and column 2, lines 22-33 and figure 1B).

10. Referring to claim 4, Galles has taught the massively parallel processing system wherein each one of the metarouters are four port routers (column 9, line 66 to column 10, line 5 and figure 7).

11. Referring to claim 6, Galles has taught a massively parallel processing system comprising:

- a. a plurality of processors (column 4, lines 7-9);
- b. a first set of routers for interconnecting the plurality of processors as two-dimensional hypercubes (column 4, lines 7-9 and figure 1B); and
- c. a second set of routers for interconnecting the first set of routers (column 4, lines 10-12) wherein the hypercubes remain in tact as the system is expanded (column 4, lines 13-15 and 28-33).

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Galles et al, U.S. Patent Number 5,669,008 (herein referred to as Galles). Referring to claim 3, Galles has taught the massively parallel processing system wherein each one of the metarouters are four port routers (column 9, line 66 to column 10, line 5 and figure 7). Galles has not explicitly taught the metarouters as eight port routers. However, Galles has taught the connection of two additional hypercubes to the metarouter, for a total of six hypercubes, in order to further expand the system and allow for greater connectivity between the expanding number of processing nodes (column 10, lines 5-13). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further increase the number of ports of the metarouter in order to connect eight hypercubes rather than six or four. Furthermore, it would have been obvious to connect duplicate hypercubes to the metarouter for multiple effects. See St. Regis Paper Co. v Bemis Co., **193 USPQ 8** (7<sup>th</sup> Cir. 1977).

14. Referring to claim 5, Galles has taught the massively parallel processing system wherein each one of the processing element nodes comprises two processors (figure 3). Galles has not explicitly taught each processing element node comprising four processors. However, Galles has taught more complex nodes with multiple processors may be utilized within the massively parallel processing system (column 5, lines 47-50) and that each processing element node can be comprised of plural hubs (figure 2), where a hub comprises two processors (figure 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ four processors in each processing element node of the massively parallel processing system.

*Conclusion*

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as follows. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

Barker et al., U.S. Patent 5,625,836, have taught an expandable parallel array processor comprising eight processors interconnected as a hypercube, forming a node, and the interconnection of a plurality of such nodes.

Baumgartner et al., U.S. Patent Number 6,334,177, have taught a non-uniform memory access (NUMA) computer where multiple processing nodes are interconnected and communicate with the memory local to each node as a single, main memory for the system.

Colley et al., U.S. Patent Number 5,113,523, have taught a first array of processor means forming a hypercube and a second array interconnecting a plurality of such hypercubes.

Conterno et al., U.S. Patent Number 5,586,258, have taught a multilevel processing system comprising the interconnection of multiprocessor modules at various levels.

Jackson et al., U.S. Patent Number 5,133,073, have taught a reconfigurable multi-dimensional processor array including a plurality of sub-processor arrays.

Laudon and Lenoski, "The SGI Origin: A ccNUMA Highly Scalable Server," ISCA, 1997, have taught a scalable interconnect network of a plurality of dual processor nodes.

Art Unit: 2183

Passint et al., U.S. Patent Number 6,230,252, have taught a scalable multiprocessor system including interconnected plural processing element nodes comprising one or more processors and local memory.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephanie M. Deckter whose telephone number is 703-308-6132. The examiner can normally be reached on 8:00 A.M. - 5:30 P.M. with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on 703-305-9712. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Stephanie M. Deckter  
Examiner  
Art Unit 2183

*SMD*

February 12, 2002

  
EDDIE CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100